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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,781	08/08/2006	Daniel R. Swiler	FER-15400.001.001	6294
7609 7590 07/15/2010 RANKIN, HILL & CLARK LLP 23755 Lorain Road - Suite 200 North Olmsted, OH 44070-2224			EXAMINER JOHNSON, SONJI N	
			ART UNIT 2887	PAPER NUMBER
			MAIL DATE 07/15/2010	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/597,781	Applicant(s) SWILER ET AL.	
	Examiner SONJI JOHNSON	Art Unit 2887	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-16, 18-30 and 33-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-16, 18-30 and 33-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Receipt is acknowledged of applicant's amendment filed on 4/03/2010. Claim(s) 4, 17 and 32 has been canceled without prejudice. Claim(s) 1, 14, 18, 27, 29 and 42-45 have been amended. Claim(s) 1-3, 5-16, 18-30, and 33-45 are pending and an action on the merits is as follows.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 3, 5-10, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jauch US Patent No. 4, 504, 084, cited by applicant in view of Swiler US Patent No. 6, 485, 557, cited by applicant.

Re claim 1, Jauch discloses a method of forming and detecting a mark on a substrate comprising:

applying a marking material (ink) comprising infrared reflective pigment to the substrate to wherein the infrared reflective pigment causes the mark (makings) to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the substrate adjacent to the mark

such that the mark can be discerned from the substrate at the predetermined wavelength (Column 1, lines 50-53; Column 2, lines 6-14 and lines 49-54; Column 3, lines 9-13);

applying a cover coating material (second color that conceals the first color) comprising an pigment that is different than the infrared reflective pigment in the marking material (second color comprises a mixture of colors) over the mark (Column 4, lines 7-9) and over at least a portion of the substrate adjacent to the mark (Column 4, lines 10-12, wherein the second color is also discloses as printed as a background layer) to form a cover coat (second color conceals the first color) wherein the cover coat appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals the mark covered by the cover coat in the visible portion of the electromagnetic spectrum (Column 2, lines 59-60) but is sufficiently transmissive of radiation emitted at the predetermined wavelength such that the mark can be discerned from the substrate through the cover coat at the predetermined wavelength (Column 2, lines 55-67; Column 3, lines 14-18); and detecting the mark applied to the substrate through the cover coat at the predetermined wavelength using an infrared detecting device (Column 2, lines 6-11).

Jauch fails to disclose that the marking material comprises an inorganic pigment.

Sullivan discloses using inorganic pigments as colorants for various types of substrates and the applying of a partial or full coating of one or more layer on the surfaces of pigments (Column 4, lines 33-35).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mark of Jauch to comprise of an inorganic pigment.

As discloses in Swiler inorganic pigments are useful as colorants and also exhibits improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 2, Jauch and Swiler discloses the method according to claim 1.

Jauch fails to disclose wherein the substrate is a surface of a part for installation in a land vehicle or aircraft (Column 1, lines 10-11) .

Swiler discloses a substrate and a coating covering at least a portion of the substrate wherein various types of substrates may be coated with inorganic pigments (Column 7, lines 52-55).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the substrate of Jauch to be of a surface of a part for installation in a land vehicle or aircraft.

Doing so would enable the highly reflective inorganic pigments to be detected on parts such that authenticity of the product can be determined..

Re claim 3, Jauch and Swiler discloses the method according to claim 1, and

Jauch fails to disclose wherein the substrate is a primer coat layer applied to a surface of an article (Column 1, lines 10-11).

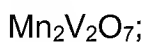
Swiler discloses using inorganic pigments to be used as colorants for various types of substrate and the applying of a partial or full coating of one or more layer of an on the surfaces of pigments (Column 4, lines 33-35 and Column 4, lines 15-18).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the substrate of Jauch to be of a primer coat layer applied to a surface of an article.

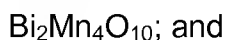
Swiler discloses that various type of substrates may be coated with the pigments and that a coating may be applied when there is an unfavorable reaction between the surface of the pigment and the medium where it's being used as a protected layer (Column 4, lines 15-18).

Re claim 5, Jauch and Swiler discloses the method according to claim 1.

Jauch fails to disclose wherein the infrared reflective inorganic pigment is one or more selected from the group consisting of:



M_1xMnO_7 , where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X + 1 and less than or equal to X + 2 and designates the number of oxygen atoms required to maintain electroneutrality;



solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony,

bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc

Swiler discloses wherein the infrared reflective inorganic pigment is $\text{Mn}_2\text{V}_2\text{O}_7$ (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23);

Therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the teachings of Swiler with the teachings of Jauch such that the infrared reflective inorganic pigment is $\text{Mn}_2\text{V}_2\text{O}_7$.

The $\text{Mn}_2\text{V}_2\text{O}_7$ as suggested by Swiler is a pigment that is useful as colorants and also possess improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 6, Jauch and Swiler discloses the method according to claim 14.

Jauch fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm .

Swiler discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Jauch to comprise of inorganic pigment sized from about 0.02 μm to about 15 μm .

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3, lines 29-31).

Re claim 7, Jauch and Swiler discloses the method according to claim 14.

Cyr fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm .

Swiler discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Jauch to comprise of inorganic pigment sized from about 0.1 μm to about 0.5 μm

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3, lines 29-31).

Re claim 8, Jauch and Swiler discloses the method according to claim 1 and Jauch further discloses wherein the substrate is selected from the group consisting of metal, glass, wood, paper, plastic and ceramic (Column 2, lines 21-22).

Re claim 9, Jauch and Swiler discloses the method according to claim 1 and Jauch further discloses wherein the marking material is selected from the group consisting of paint, enamel, laser marking composition, glass, ink, putties and fillers, chemical etchants and transfer films (Column 2, lines 20-27).

Re claim 10, Jauch and Swiler discloses the method according to claim 1 and Jauch further discloses wherein the cover coating material is selected from the group consisting of paint, glass, enamel, ink, and transfer films (Column 2, lines 58-60)

Re claim 12, Jauch and Swiler discloses the method according to claim .

Jauch fails to disclose wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

Swiler discloses wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve (Column 6, lines 32-44)

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pigment of Jauch to comprise of inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color , composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 13, Jauch and Swiler discloses the method according to claim 1.

Jauch fails to disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

Swiler disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover of Jauch to comprise of two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color, composition and performance characteristic such that a desired infrared reflectance will be achieved.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jauch US Patent No. 4, 504, 084, cited by applicant in view of Swiler US Patent No. 6, 485, 557, cited by applicant as applied to claim 1 above, and further in view of Cyr et al. US Patent No. 6, 138, 913.

Re claim 11, Jauch and Swiler discloses the method according to claim 1.

Jauch and Swiler fail to disclose wherein the mark is in the form of a machine-readable code.

Cyr discloses an invisible barcode imprinted on a substrate(Column 5, lines 32-35 and Abstract)

Given the teachings of Cyr it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the coded marking of Jauch to be a barcode.

A barcode provides efficient automatic data entry with relatively inexpensive data processing apparatus.

5. Claims 14- 16, 18-31 and 33-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cyr et al. US Patent No. 6, 138, 913 cited by applicant in view of Swiler US Patent No. 6, 485, 557, cited by applicant

Re claim 14, Cyr discloses a method of forming a durable infrared detectable mark on a substrate comprising:

applying a marking material comprising an infrared reflective pigment to the substrate to form a mark (Column 7, lines 7-8);

applying a masking marking material over at least a portion of the mark and optionally over a portion of the substrate to form a mask (applying a first separating layer) proximal to the mark (Column 7, lines 9-10 and lines 19-23), wherein the infrared reflective causes the mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the contrast mark such that the mark can be discerned from the contrast mark at the predetermined wavelength (Column 4, lines 43-50; Column 6, lines 34-37; Column 7, lines 57-63); and

applying a cover coating material (second separating layer) comprising an pigment that is different than the infrared reflective in the marking material (Column 7, lines 7-13) over the mark and the contrast mark to form a cover coat that. wherein the cover coat appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals both the mark and the contrast mark covered by the

cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength such that the mark can be discerned from the contrast mark through the cover coat at the predetermined wavelength (Column 4, lines 43-50; Column 6, lines 34-37; Column 7, lines 55-63, Column 7, lines 9-10 and see claims 16-17),.

Cyr fails to disclose that the mark comprises an inorganic pigment.

Sullivan discloses using inorganic pigments to be used as colorants for various types of substrate and the applying of a partial or full coating of one or more layer of an on the surfaces of pigments (Column 4, lines 33-35).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mark to comprise of an inorganic pigment.

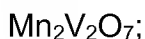
As discloses in Swiler inorganic pigments are useful as colorants and also exhibits improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 15, Cyr and Swiler discloses the method according to claim 14 and Cyr further discloses wherein the substrate is a surface of an article (Column 4, lines 27-30, lines 48-50 and Column 5, lines 44-50).

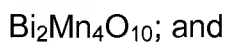
Re claim 16, Cyr and Swiler discloses the method according to claim 14 and Cyr further discloses wherein the substrate is a primer coat layer applied to a surface of an article (Column 4, lines 27-30, lines 48-50 and Column 5, lines 44-50).

Re claim 18, Cyr and Swiler discloses the method according to claim 14.

Cyr fails to disclose wherein the infrared reflective inorganic pigment is one or more selected from the group consisting of:



$\text{M1}_x\text{MnO}_7$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to $X + 1$ and less than or equal to $X + 2$ and designates the number of oxygen atoms required to maintain electroneutrality;



solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc

Swiler discloses wherein the infrared reflective inorganic pigment is $\text{Mn}_2\text{V}_2\text{O}_7$ (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23);

Therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the teachings of Swiler with the teachings of Cyr such that the infrared reflective inorganic pigment is $\text{Mn}_2\text{V}_2\text{O}_7$.

The $\text{Mn}_2\text{V}_2\text{O}_7$ as suggested by Swiler is a pigment that is useful as colorants and also possess improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 19, Cyr and Swiler discloses the method according to claim 14.

Cyr fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm .

Swiler discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Cyr to comprise of inorganic pigment sized from about 0.02 μm to about 15 μm .

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3, lines 29-31).

Re claim 20, Cyr and Swiler discloses the method according to claim 14.

Cyr fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Cyr to comprise of inorganic pigment sized from about 0.1 μm to about 0.5 μm

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3, lines 29-31).

Re claim 21, Cyr and Swiler discloses the method according to claim 14 and Cyr further discloses wherein the substrate is selected from the group consisting of metal, glass, wood, plastic and ceramic (Column 5, lines 44-55).

Re claim 22, Cyr and Swiler discloses the method according to claim 14 and Cyr further discloses wherein the marking material is selected from the group consisting of paint, enamel, laser marking composition, glass, ink, and transfer films (Column 4, line 42).

Re claim 23, Cyr and Swiler discloses the method according to claim 14 and Cyr further discloses wherein the cover coating material is selected from the group consisting of paint, glass, enamel, ink, and transfer films (Column 7, lines 18-13)

Re claim 24, Cyr and Swiler disclose the method according to claim 14 and Cyr further discloses wherein the mark is in the form of a bar code (Column 5, line 25; Fig. 4).

Re claim 25, Cyr and Swiler discloses the method according to claim 14.

Cyr fails to disclose wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve .

Swiler disclose wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve (Column 3,lines 53-56 and Column 6,lines 32-44)

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pigment of Cyr to comprise of inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color , composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 26, Cyr and Swiler discloses the method according to claim 14.

Cyr fails to disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve (Column 4, lines 1-17 and 59-66, Fig 4).

Swiler disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover of Cyr to comprise of two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color, composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 27, Cyr and Swiler discloses the method according to claim 14.

Cyr fails to disclose wherein the marking material comprises and infrared reflective inorganic pigment..

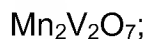
Swiler disclose wherein the marking material comprises and infrared reflective inorganic pigment.(Abstract, Column 2, lines 24-26 and Column 3, lines 16-23 and Column 4,lines 9-13).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mark of Cyr to comprise of an highly reflective inorganic pigment.

As discloses in Swiler inorganic pigments are useful as colorants and also exhibits improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

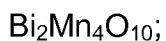
Re claim 28, Cyr and Swiler discloses the method according to claim 27.

Cyr fails to disclose wherein the infrared reflective inorganic pigment in the contract marking material is one or more selected from the group consisting of:



$\text{M1}_x\text{MnO}_7$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X + 1 and less

than or equal to $X + 2$ and designates the number of oxygen atoms required to maintain electroneutrality;



solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc

Swiler discloses wherein the infrared reflective inorganic pigment is $\text{Mn}_2\text{V}_2\text{O}_7$ (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23);

Therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the teachings of Swiler with the teachings of Cyr such that the infrared reflective inorganic pigment is $\text{Mn}_2\text{V}_2\text{O}_7$.

The $\text{Mn}_2\text{V}_2\text{O}_7$ as suggested by Swiler is a pigment that is useful as colorants and also possess improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 29, Cyr discloses a method of forming a durable infrared detectable mark on a substrate comprising:

applying a marking material comprising an infrared reflective pigment to the substrate to form a mark (Column 7, lines 7-8);

applying a masking material over a least a portion of the mark and optionally over a portion of the substrate, to form a mask (the first separating layer) (Column 7, lines 9-10 and lines 19-23), wherein the infrared reflective pigment causes the mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the contrast mark such that the mark can be discerned from the contrast mark at the predetermined wavelength (Column 4, lines 43-50; Column 6, lines 34-37; Column 7, lines 57-63); and

applying a cover coating material (second separating layer) comprising an pigment that is different than the infrared reflective pigment in the marking material (Column 7, lines 7-13) over the mark and the contrast mark to form a cover coat that wherein the cover coat appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals both the mark and the contrast mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength such that the mark can be discerned from the contrast mark through the cover coat at the predetermined wavelength (Column 4, lines 43-50; Column 6, lines 34-37; Column 7, lines 55-63, Column 7, lines 9-10 and see claims 16-17),.

Cyr fails to disclose that the mark comprises an inorganic pigment.

Sullivan discloses using inorganic pigments to be used as colorants for various types of substrate and the applying of a partial or full coating of one or more layer of an on the surfaces of pigments (Column 4, lines 33-35).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mark to comprise of an inorganic pigment.

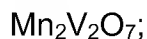
As discloses in Swiler inorganic pigments are useful as colorants and also exhibits improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 30, Cyr and Swiler discloses the method according to claim 29 and Cyr further discloses wherein the substrate is a surface of an article (Column 4, lines 27-30, lines 48-50 and Column 5, lines 44-50).

Re claim 31, Cyr and Swiler discloses the method according to claim 29 and Cyr further discloses wherein the substrate is a base coat layer applied to a surface of an article (Column 4, lines 27-30, lines 48-50 and Column 5, lines 44-50).

Re claim 33, Cyr and Swiler discloses the method according to claim 32.

Cyr fails to disclose wherein the infrared reflective inorganic pigment is one or more selected from the group consisting of:



M_1xMnO_7 , where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X + 1 and less

than or equal to $X + 2$ and designates the number of oxygen atoms required to maintain electroneutrality;

$\text{Bi}_2\text{Mn}_4\text{O}_{10}$; and

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc

Swiler discloses wherein the infrared reflective inorganic pigment is $\text{Mn}_2\text{V}_2\text{O}_7$ (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23);

Swiler further discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about $0.02\text{ }\mu\text{m}$ to about $15\text{ }\mu\text{m}$ (Column 3, lines 24-28).

Swiler further discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about $0.1\text{ }\mu\text{m}$ to about $0.5\text{ }\mu\text{m}$ (Column 3, lines 24-28).

Therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the teachings of Swiler with the teachings of Cyr such that the infrared reflective inorganic pigment is $\text{Mn}_2\text{V}_2\text{O}_7$.

The $\text{Mn}_2\text{V}_2\text{O}_7$ as suggested by Swiler is a pigment that is useful as colorants and also possess improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 34, Cyr and Swiler discloses the method according to claim 29.

Cyr fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm .

Swiler discloses wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Cyr to comprise of inorganic pigment sized from about 0.02 μm to about 15 μm .

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3, lines 29-31).

Re claim 35, Cyr and Swiler discloses the method according to claim 29.

Cyr fails to disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm .

Swiler disclose wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm (Column 3, lines 24-28).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover coat pigment of Cyr to comprise of inorganic pigment sized from about 0.1 μm to about 0.5 μm

As suggested by Swiler particles of that size have been founded to possess favorable colorant properties (Column 3, lines 29-31).

Re claim 36, Cyr and Swiler discloses the method according to claim 29 and Cyr further discloses wherein the substrate is selected from the group consisting of metal, glass, wood, plastic and ceramic (Column 5, lines 44-55).

Re claim 37, Cyr and Swiler discloses the method according to claim 29 and Cyr further discloses wherein the marking material is selected from the group consisting of paint, enamel, laser marking composition, glass, ink, and transfer films (Column 4, line 42).

Re claim 38, Cyr and Swiler discloses the method according to claim 14 and Cyr further discloses wherein the cover coating material is selected from the group consisting of paint, glass, enamel, ink, and transfer films (Column 7, lines 18-13).

Re claim 39, Cyr and Swiler disclose the method according to claim 29 and Cyr further discloses wherein the mark is in the form of a bar code (Column 5, line 25; Fig. 4).

Re claim 40, Cyr and Swiler discloses the method according to claim 29.

Cyr fails to disclose wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve .

Swiler disclose wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve (Column 3,lines 53-56 and Column 6,lines 32-44)

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the pigment of Cyr to comprise of inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color , composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 41, , Cyr and Swiler discloses the method according to claim 29.

Cyr fails to disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve

Swiler disclose wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve (Column 6, lines 32-44 and Column 3,lines 53-56)

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cover of Cyr to comprise of two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

The substituting of other elements in the highly reflecting inorganic pigment will enhance the color, composition and performance characteristic such that a desired infrared reflectance will be achieved.

Re claim 42, Cyr and Swiler disclose the method according to claim 29 and Cyr further disclose an infrared reflective pigment that is different than the infrared reflective pigment in the marking material.

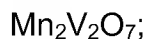
Swiler disclose wherein the marking material comprises an infrared reflective inorganic pigment (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23 and Column 4, lines 9-13).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mark of Cyr to comprise of an highly reflective inorganic pigment.

As discloses in Swiler inorganic pigments are useful as colorants and also exhibits improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

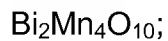
Re claim 43, Cyr and Swiler discloses the method according to claim 42.

Cyr fails to disclose wherein the infrared reflective inorganic pigment in the masking material is one or more selected from the group consisting of:



$\text{M1}_x\text{MnO}_7$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to $X + 1$ and less

than or equal to $X + 2$ and designates the number of oxygen atoms required to maintain electroneutrality;



solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc

Swiler discloses wherein the infrared reflective inorganic pigment is $\text{Mn}_2\text{V}_2\text{O}_7$ (Abstract, Column 2, lines 24-26 and Column 3, lines 16-23);

Therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the teachings of Swiler with the teachings of Cyr such that the infrared reflective inorganic pigment is $\text{Mn}_2\text{V}_2\text{O}_7$.

The $\text{Mn}_2\text{V}_2\text{O}_7$ as suggested by Swiler is a pigment that is useful as colorants and also possess improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 44, Jauch discloses a non-visible authentication mark comprising a mark disposed between a substrate and a cover coating layer that covers the mark and

at least a portion of the substrate surrounding the mark (Column 4, lines 10-12, wherein the second color is also disclosed as printed as a background layer) , wherein the mark comprises an infrared reflective pigment and the cover coating layer comprises an pigment that is different than the infrared reflective inorganic pigment in the mark (column 2,lines 51-61), wherein the infrared reflective inorganic pigment in the mark causes the mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the substrate covered by the cover coating layer, and wherein the cover coating layer appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals the mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength that the mark can be discerned from the substrate through the cover coating layer at the predetermined wavelength (Column 1,lines 49-53 and Column 2,lines 50-65 and lines 3-13).

Jauch fails to disclose that the mark and the cover coating comprise an inorganic pigment.

Sullivan discloses using inorganic pigments to be used as colorants for various types of substrates and the applying of a partial or full coating of one or more layer on the surfaces of pigments (Column 4,lines 33-35).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mark and cover coating of Jauch to comprise of an inorganic pigment.

As disclosed in Swiler inorganic pigments are useful as colorants and also exhibits improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Re claim 45, Jauch discloses an article marked with a non-visible authentication mark comprising a mark disposed between a surface of the article and a cover coating layer that covers the mark and at least a portion of the substrate surrounding the mark (Column 4, lines 10-12, wherein the second color is also disclosed as printed as a background layer), wherein the mark comprises an infrared reflective pigment and the cover coating layer comprises a pigment that is different than the infrared reflective inorganic pigment in the mark (column 2, lines 51-61), wherein the infrared reflective inorganic pigment in the mark causes the mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the surface of the article beneath the cover coating adjacent to the mark, and wherein the cover coating layer appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals the mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength that the mark can be discerned from the surface of the article beneath the cover coating adjacent to the marking layer through the cover coating layer at the predetermined wavelength (Column 1, lines 49-53 and Column 2, lines 50-65 and lines 3-13).

Jauch fails to disclose that the mark and the cover coating comprise an inorganic pigment.

Sullivan discloses using inorganic pigments to be used as colorants for various types of substrates and the applying of a partial or full coating of one or more layer on the surfaces of pigments (Column 4, lines 33-35).

Given the teachings of Swiler it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mark and cover coating of Jauch to comprise of an inorganic pigment.

As discloses in Swiler inorganic pigments are useful as colorants and also exhibits improved reflectance characteristics in the infrared region thereby reducing IR-induced heat build up (Column 4, lines 37-41).

Response to Arguments

6. Applicant's arguments with respect to claims 1, 14, 29, 33 and 44-45 have been considered but are moot in view of the new ground(s) of rejection.
7. Applicant amended the claims with new limitations which necessitated new search and consideration.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SONJI JOHNSON whose telephone number is 571-270-5266. The examiner can normally be reached on Monday-Thursday 7:30 AM -6:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve S. Paik can be reached on 571-272-2404. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SONJI JOHNSON/
Examiner, Art Unit 2887

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